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Identification of the Residue in the Bolgar Medieval Sphero-Conical Vessel by Gas Chromatography – Mass Spectrometry

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Abstract

© 2017 University of Oxford The Golden Horde sphero-conical vessel retrieved from the ruins of the medieval city of Bolgar (Russia, Republic of Tat arstan) during archaeological excavations, which contained residue in the form of encrustation on the bottom and the wall, was analysed in the NRC 'Kurchatov Institute' by X-ray phase analysis and high-performance liquid and gas chromatography with MS detectors (HPLC–MS, GC–MS). The GC–MS method established that the residue from the sphero-conical vessel was comprised primarily of abietic acid derivatives (around 46%) and retene, which is polycyclic aromatic hydrocarbon (around 27%); this means that turpentine exuded from the stems of certain species of coniferous trees, called resin and subsequently heat-treated, was poured into the vessel. Researchers have been trying to decipher the function of these mysterious vessels for 200 years, and this is the first time that resin stored in a sphero-conical vessel has been documented. Potentially, this vessel was probably used as a personal 'medical kit'.

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Keywords

Chromatographic analysis, medieval sphero-conical vessels, resin

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